

**Subject Name: Programming with Python****B.Tech. Year - II**

**Objective:** The course is designed to provide Basic knowledge of Python. Main objective of this subject is to learn why python is useful scripting language for all and how to design and program Python applications.

**Credits Earned:** 4 Credits

**Course Outcomes:** After completion of this course, student will be able to

- Recognize various data structures and apply them in solving computational problems.
- Understand and apply different file handling operations
- Apply core python and object-oriented python concepts to build real world applications
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- Interpret data using NumPy and Pandas library.
- Demonstrate substantial knowledge with the Python program development environment.
- Develop proficiency in application development using the Python Programming Language.

**Pre-requisite of course:** NA.

**Teaching and Examination Scheme**

Teaching Scheme (Hours)	Credits	Theory Marks	Tutorial/ Practical Marks	Total
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Theory	Tutorial	Practical		ESE (E)	IA	CSE	Viva (V)	Term work (TW)	Marks
3	0	2	4	50	30	20	25	25	150



**Contents:**

<b>Unit</b>	<b>Topics</b>	<b>Contact Hours</b>
1	<b>Introduction to Python</b> Installation and working with python, Features, Python Interpreter and its working, Syntax and Semantics, Python variables, immutable variables and Blocks	4
2	<b>Python Data Types</b> Data Types, Declaring and using Numeric and string data type, string operations, Assignments, Operators, Expressions, Comments	4
3	<b>Program Flow Control</b> Conditional blocks using if, else and elif, Simple For loop, For loop using Ranges, While loops, Loop manipulation using Pass, Continue, Break and Else	3
4	<b>Python Functions</b> Organizing python codes using functions and Modules, Python Functions	4
5	<b>String, List Tuple and Dictionary</b> Introduction to String, List, Tuple and Dictionary, working with in-built methods of String and List, Tuple and Dictionary manipulation using in-built methods	6
6	<b>Exceptional Handling</b> Exception, Types of errors, Handling an exception, try, expect, else, try-finally clause, Argument of an Exception, Raising an Exception	3
7	<b>File Handling</b> Files, Types of Files in python, Read and Write functions, Working with Text Files, Manipulating file pointer using Seek and Tell and various File Operations	3
8	<b>Classes and Objects</b> Creating Classes and Objects, Instance Variables, Access Specifiers, Importance of self, __init()__Method, Instance Method, Class Method,	6
9	<b>Regular Expression and Database Integration</b> Regular Expressions, Match function, Search function, Matching vs Searching, Wildcard	4



10	<p><b>Data Analytics and Visualization</b></p> <p>NumPy Library – Introduction and Installation of NumPy, NumPy Arrays, Array creation using built-in functions, Attributes and Methods, Array manipulation, Indexing and Iterating</p> <p>Pandas Library – Introduction to Pandas, Pandas Series, Data Frame, Importing and Exporting data with Excel files, Manipulating a Data Frame</p> <p>Visualization – Introduction to Matplotlib, Types of Charts, Legends, annotations and style, Plotting directly from Pandas Data Frame and NumPy Arrays</p>	5
	<b>Total Hours</b>	

**References:**

1. Introduction to Computing and Problem Solving with Python by Jeeva Jose and P. Sojan Lal.
2. Python: The Complete Reference by Martin C. Brown
3. Python for Data Analysis by Wes McKinney

**Suggested Theory distribution:**

The suggested theory distribution as per Bloom’s taxonomy is as per follows. This distribution serves as guidelines for teachers and students to achieve effective teaching-learning process.

Distribution of Theory for course delivery and evaluation					
Remember	Understand	Apply	Analyse	Evaluate	Create
20%	20%	30%	15%	10%	5%